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July 3, 2007
Date

Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before The Board of Patent Appeals and Interferences

Appellants: Youngpeter, Bryan; et al

Serial No: 10/631,129

Filed: July 31, 2003

Group Art Unit: 3746

Examiner: Freay, Charles Grant

Title: Power Steering Pump Having Electronic ByPass Control

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

This appeal is from a Final Rejection dated February 7, 2007. Notice of Appeal was filed on May 7, 2007. Authorization to charge the appropriate fee to a USPTO Deposit Account is found in the signature page of this Brief.

I. REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i))

By assignment, the owner of the application is:

Automotive Components Holdings, LLC.
17000 Rotunda Drive,
Dearborn, Michigan 48120

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii))

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS (37 C.F.R. § 41.37(c)(1)(iii))

Claims in the application: 7-11

Claims cancelled: 1 - 6

Claims rejected: 7 -11

Claims being appealed: 7-11

IV. STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv))

There are no other outstanding amendments filed after the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v))

In general, the claims are directed to a power steering pump as is used in automotive vehicles. Power steering pumps normally include bypass valves to provide pressure relief by controlling the amount of diversion of hydraulic fluid from the output of the pump to the input of the pump or to its source at those times when more or less steering assist is required. In most cases, the bypass valve control is controlled by mechanical means in reaction to either the speed at which the pump is driven or by the internal pressures of the pump sensed by the valve. In some cases, electrical control has been employed to control a bypass valve.

The claimed invention is directed to a power steering pump which includes an electrically controlled bypass valve of a unique configuration that functions to provide improvements in the overall operation and efficiencies, as compared to prior art pumps.

Independent claim 7 is directed to a power steering pump [10] that includes a housing [12] which defines a bore [34] having an axis [36], an outlet [28] adjacent one end of the bore [34], a fluid discharge port [20] communicating with the bore [34] at a first axial location and a fluid bypass port [30] communicating with the bore [34] at a second axial location. The pump [10] also includes pumping elements (rotors [14], vanes [26] and cam chamber [18]) disposed within the housing [10] for pumping fluid to the fluid discharge port

[20] and communicating with the bypass port [30] for drawing fluid therefrom. A flow control valve [38] is slideably received in the bore [34] and defines an inlet to the bypass port [30]. A plunger [78] is operatively connected to the flow control valve [38] and is responsive to an applied electromagnetic field to slide the flow control valve [38] to various positions between a fully closed position wherein the flow control valve [38] closes the inlet to the bypass port [30] and a fully open position wherein maximum fluid flows from the bore to the fluid bypass port through the inlet [48]. A spring [68] is operatively coupled to the flow control valve [38] for biasing the flow control valve [38] in the open position and an electromagnetic coil [62] is included for applying an electromagnetic field to the plunger [78] to vary the position of the plunger [78] and thereby vary the size of the inlet and to proportionally control fluid flow to the fluid bypass port [30].

Independent Claim 10 is directed to a power steering pump [10] that includes a housing [12] defining a bore [34] having an axis [36] and open end as well as a fluid discharge port [28] communicating with the bore [34] at a first axial location proximate to the open end, and a fluid bypass port [30] communicating with the bore [34] at a second axial location. The pump [10] also includes pumping elements (rotors [14], vanes [26] and cam chamber [18]) disposed within the housing [12] and adapted for drawing fluid from the fluid bypass port [30] and pumping fluid to the fluid discharge port [28]. In this case, a sleeve [40] is received in the bore [34] which has an opening [46] communicating with the fluid bypass port [30]. A flow control valve [38] is slideably received in the bore [34] and has an opening [56]. The flow control valve [38] is slideable to various positions between a fully closed position that closes the opening [46] in the sleeve [40] and a fully open position. The opening [56] in the flow control valve [38] cooperates with the opening [46] in the sleeve [40] to define an inlet to proportionally control fluid flow to the fluid bypass port [30]. In addition, a tubular extension [64] is sealingly mounted onto the housing [10] at the open end and a plunger [78] is disposed within the tubular extension and operatively connected to the flow control valve. The plunger [78] is responsive to an applied electromagnetic field to slide the valve [38] axially to various open positions between the fully closed position and the fully open position and to vary the position of the flow control valve [38] and thereby vary the size of the inlet to the fluid bypass port [30]. A spring [70] engages the plunger [78] and is included for biasing the flow control valve in the open

position. An electromagnetic coil [62] is disposed about the extension. The coil is adapted for applying an electromagnetic field to the plunger [78] and causing it to be responsively positioned.

VI. GROUNDS OF REJECTION (37CFR § 41.37(c)(1)(vi))

First Ground of Rejection:

Rejection of Claims 7-11 under 35 USC 103(a) as being unpatentable over Fujimura, et al 5,860,797 in view of Duffy 4,828,067.

Second Ground of Rejection:

Rejection of Claims 7-11 under the non-statutory grounds of obviousness-type double patenting over claims 2, 4, 5, 7 8 and 10-14 of co-pending Application No. 10/631363.

VII. ARGUMENT (37CFR § 41.37(c)(1)(vii))

First Ground of Rejection:

Claims 7-11

Appellants' Request for Reconsideration After Final Rejection (page 3, lines 13 + et seq.) explains how the Examiner failed to establish a prima facie case of obviousness and failed to provide sufficient and valid evidence to support a rejection of claims based on 35 USC 103(a).

- There was a failure to analyze the knowledge necessary by one skilled in art at the time of the invention was made which would have motivated such a person to make the proposed modification or the claimed invention.
- There was a failure to describe how the cited references suggested the motivation to the combination or modification proposed by the Examiner.
- There was a failure to acknowledge that the combined references did not provide a coherent and conclusive teaching of the claimed invention.

Even after receiving the detailed explanation in the aforementioned Request for Reconsideration, the Examiner refused to withdraw the rejection and caused this appeal.

In this case, the main reference relied on, Fujimura et al, fails to describe or show the claimed invention and fails to suggest the combination of elements the Examiner has attempted to assemble by combining it with Duffy. By alleging that electrically controlled valves are well known, The Examiner has combined Fujimura, et al (mechanically controlled) with Duffy (electrically controlled). However, even that combination is insufficient if view of the claim language.

Neither Fujimura, et al nor Duffy suggest a steering pump with the elements of the combination as set forth in claims 7-11. Additionally, there is no suggestion in either patent or in any other publication cited to date which would lead one skilled in the art to make the combination alleged by the Examiner. The Examiner has not expressed any particular knowledge by one skilled in this art that would cause such individual to make the alleged combination.

Rather than suggest that the device should be modified to be electrically controlled, Fujimura et al teaches away from such a concept. Fujimura et al discloses a flow rate control device for a power steering pump that includes a hydraulic pressure reactive spool valve 16. The spool valve is elongated, but not uniform diameter, and is axially slidable within an inner hole 15 in a housing 1. The spool valve responds to feedback pressure from the discharge port to slide within the hole and regulate the amount of operating fluid that flows back to a pump reservoir (col. 5, lines 1-3). The concept employed uses the principle of preventing by-pass flow when the system is at rest and only opening up the by-pass flow path in response to pump fluid pressure. There is no mention or suggestion in Fujimura et al that one should add any electrical control to the valve shown in its many embodiments or how such modification should be applied.

The Examiner took note of some of the deficiencies in Fujimura et al by stating: "Fujimura et al does not disclose an electrical means for sliding the flow control valve." However, Fujimura et al also fails to disclose other claimed elements. For instance, a plunger element that is operatively connected to the flow valve and responsive to an applied electric field to slide the flow control valve to various positions between fully closed and fully open positions. Further, Fujimura et al fails to disclose a spring that is operatively coupled to the flow control valve for biasing the flow control valve in the open position.

Rather, Fujimura et al teaches the use of springs to bias the valve in a closed position to close fluid flow to the by-pass port.

As mentioned above, Fujimura et al teaches that the valved pathway from the input port 1b to the bypass port 1a is closed by the position of the spool valve 16 when in its normally biased position. The spring 15 functions to bias the valve to keep this pathway normally closed. It is only after sufficient pressure is achieved in the discharge pressure chamber 25 and is in balance with the pressure in the pressure reducing chamber 23 that the spool element 16 is moved to the left (Fig. 3 and col. 4, lines 55-67)) and causes the communication between input port to the bypass port. This is completely opposite to what Appellants are claiming.

Duffy teaches an electronically controlled throttling valve for use in conjunction with a power steering system. In reaction to various sensor outputs in the system, a CPU applies pulse width modulation signals to an electromagnetic coil to axially adjust the valve to predetermined positions and correspondingly adjust the degree of restriction between the input and output passages of the valve. The throttle valve of Duffy does not perform the same functions of the claimed invention because it is merely a solenoid driven valve that opens and closes a by-pass path in a pump system.

The Examiner has made the leap to conclude that the combined teachings of Fujimura et al and Duffy render the claims obvious, without defining the attributes of one skilled in the art; without knowing what one skilled in the art would have done in the face of those references; and without finding one hint or suggestion in either Fujimura et al or Duffy that the elements of the Appellants' claims are directed to an obvious combination. The Examiner's analysis of the references failed to take into account the four criteria stated in MPEP §706.02(j) Contents of a 35 U.S.C. 103 Rejection:

> *"...the Examiner should set forth in the Office action:*
> *(A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,*
> ***(B) the difference or differences in the claim over the applied reference(s),***
> ***(C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and***

(D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification."
(emphasis added)

In particular, the Examiner did not comply with parts B, C and D of the above-quoted MPEP Section.

The Examiner has made a conclusion that *"...it would have been obvious to one of ordinary skill in the art to modify Fujimura et al by replacing the hydraulic actuation with an electrical means as taught by Duffy to regulate flow to the fluid bypass port as a means of electronically controlling the valve is [sp] response to vehicle specific values. such as speed."* Contrary to the Examiner's conclusion, and as required by the MPEP and case law, the basis for combining references to support a rejection on obviousness must come from the references themselves or that knowledge generally available to one of ordinary skill in the art to modify the reference or to combine the relevant teachings. The mere fact that the two references are in the same field does not provide the necessary knowledge, suggestion or obvious push to make the combination. Moreover, the knowledge that one skilled in the art must have to make the combination has not been alleged or in any way presented.

Another basic failure in the alleged combination made by the Examiner is the "obvious" result of such combination. It is not conclusive that if one were to combine the references cited by the Examiner, that Appellants' invention would be the result. For instance, if one skilled in the art were to add an electrical coil to Fujimura et al device, where would it be added? What alterations would be needed to make the valve perform as Appellants have claimed? How would the chambers have to be modified since the device is no longer pressure controlled. These are but a few of the questions that were not addressed in the alleged combination. Appellants submit that the broad concept of adding electrical control to a by-pass valve is not what is claimed in the application. Rather, a precise combination of interactive elements is recited in the claims and neither of the references, individually or in combination can show those claims to be a mere obvious rendering of the references.

The recent case KSR International Co. v. Teleflex, Inc. 550 U.S. ____ (2007) No. 04-1350, reinforces the principle in Graham v. John Deere 383 U.S. 1 (1966):

> "Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." *Id.*, at 17.18.

The rejection being discussed in this brief also fails under that test. Short of Appellants' recitation in the claims, there is no other basis on which one can allege the combination at the time of Appellants' invention. No level of ordinary skill test. No determination against that background. No secondary considerations were made, such as the teaching away by the Fujimura et al patent. In addition, the references as combined by the Examiner are insufficient to evidence a rejection under 35 USC (103)(a).

Accordingly, the Examiner's decision should be reversed and the Board should hold that the claims are allowable over the cited references.

Second Ground of Rejection:

Claims 7-11

According to the MPEP 804.02 Avoiding a Double Patenting Rejection:

> "A rejection based on a nonstatutory type of double patenting can be avoided by filing a terminal disclaimer in the application or proceeding in which the rejection is made. "

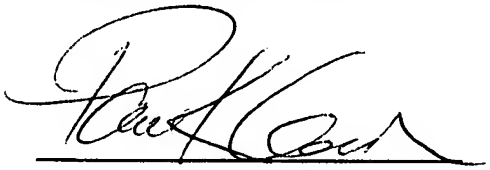
Appellants' Request for Reconsideration After Final Rejection was accompanied by a terminal disclaimer. Therefore, this rejection under the non-statutory grounds of obviousness-type double patenting over claims 2, 4, 5, 7 8 and 10-14 of co-pending Application No. 10/631363 should have been withdrawn.

VII. Conclusion

For each of the reasons discussed above, including the failure of the cited references to support the rejections under 35 USC §103(a), Appellants request this Honorable Board to reverse the rejection of the claims by the Examiner and to hold allowable all claims under consideration in the application.

This Appeal Brief is being submitted in triplicate. Please charge Deposit Account 50-3708 the statutory fee for filing this document as required by 37 CFR 1.17(f). A copy of this sheet is provided for accounting purposes.

Respectfully submitted,



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CLAIMS APPENDIX (37CFR § 41.37(c)(1)(viii))

7. A power steering pump comprising:

a housing defining a bore having an axis, an outlet adjacent one end of the bore, a fluid discharge port communicating with the bore at a first axial location, and a fluid bypass port communicating with the bore at a second axial location;

pumping elements disposed within the housing for pumping fluid to said fluid discharge port and communicating with said bypass port for drawing fluid therefrom;

a flow control valve slideably received in the bore and defining an inlet to the bypass port;

a plunger operatively connected to the flow control valve and responsive to an applied electromagnetic field to slide the flow control valve to various positions between a fully closed position wherein the flow control valve closes the inlet and a fully open position wherein maximum fluid flows from the bore to the fluid bypass port through the inlet;

a spring operatively coupled to the flow control valve for biasing the flow control valve in the open position;

an electromagnetic coil for applying an electromagnetic field to the plunger to vary the position of the plunger and thereby vary the size of the inlet and to proportionally control fluid flow to the fluid bypass port.

8. A power steering pump in accordance with claim 7 wherein the pumping elements comprise a cam chamber and a rotor having retractable vanes disposed within the cam chamber.

9. A power steering pump in accordance with claim 7, further comprising a sleeve received in the bore and having an opening communicating with the fluid bypass port, and wherein the flow control valve is slideably received within the sleeve and includes an opening that cooperates with the opening in the sleeve to define the inlet to the fluid bypass port.

10. A power steering pump comprising:

a housing defining a bore having an axis and open end, a fluid discharge port communicating with the bore at a first axial location proximate to the open end, and a fluid bypass port communicating with the bore at a second axial location;

pumping elements disposed within the housing and adapted for drawing fluid from the fluid bypass port and pumping fluid to said fluid discharge port;

a sleeve received in bore and having an opening communicating with the fluid bypass port;

a flow control valve slideably received in the bore having an opening, said flow control valve being slideable to various positions between a fully closed position that closes the opening in the sleeve and a fully open position, wherein the opening in the flow control valve cooperates with the opening in the sleeve to define an inlet to [allow] proportionally control fluid flow to the fluid bypass port;

a tubular extension sealing mounted onto the housing at said open end;

a plunger disposed within the tubular extension and operatively connected to the flow control valve, said plunger being responsive to an applied electromagnetic field to slide the valve axially to various open positions between the fully closed position and the fully open position and to vary the position of the flow control valve to thereby vary the size of the inlet;

a spring engaging the plunger for biasing the flow control valve in the open position;

an electromagnetic coil disposed about the extension and adapted for applying an electromagnetic field to the plunger and causing it to be responsively positioned.

11. A power steering pump in accordance with claim 10 wherein the extension includes an end cap, and wherein plunger includes a rear end adjacent the end cap and a pressure equalization passage extending from the rear end and communicating with fluid adjacent the flow control valve.